

Claims

- [c1] 1. A flashlight control device, for a digital camera, to control an amount of a light-emission of a flashlight, comprising:
- a charger, including a charger circuit and a capacitor for receiving a charge-enabling signal from a central processor unit, wherein said charger responsive to said charge enabling-signal charges said capacitor;
 - a detector, coupled to said charger, for detecting a voltage of said capacitor, when the voltage of said capacitor reaches a predetermined voltage, said detector disabling said charger to stop charging said capacitor and said detector generating a charge-complete signal to inform said central processor unit;
 - a flashlight trigger circuit, coupled to said charger, for receiving a voltage of said capacitor, wherein said central processor unit responsive to said charge-complete signal generates a flashlight-trigger signal to enable said flashlight trigger circuit to emit an incident light to an object; and
 - a light-tuning circuit, coupled to said flashlight trigger circuit, for receiving a reflected light from said object and conversing said reflected light to a exposure volt-

age, when said exposure voltage is higher than a reference voltage, said light-tuning circuit disabling said flashlight trigger circuit to stop emitting said incident light.

- [c2] 2. The flashlight control device of claim 1, said light-tuning circuit further comprising:
- a phototransistor for receiving said reflected light and conversing said reflected light to an exposure current;
 - an integrator, coupled to said phototransistor, for integrating said exposure current to output said exposure voltage;
 - a comparator circuit, coupled to said integrator, for comparing said exposure voltage and said reference voltage and outputting a comparison signal, said comparison signal being an enabled-comparison signal when said exposure voltage is higher than said reference voltage; and
 - a logical gate, coupled to said comparator circuit, responsive to said comparison signal and said flashlight-trigger signal generating a flashlight-driving signal to said flashlight trigger circuit, said flashlight-driving signal, responsive to said enabled-comparison signal, disabling said flashlight trigger circuit to stop emitting said incident light.

- [c3] 3. The flashlight control device of claim 2, wherein said logic gate is a NOR gate.
- [c4] 4. The flashlight control device of claim 2, where in said light-tuning circuit further comprises a voltage generating circuit, coupled to said comparator circuit, for receiving a reference signal from said central processor unit and adjusting and lowpass-filtering said reference signal to output said reference voltage.
- [c5] 5. The flashlight control device of claim 4, said voltage generating circuit further comprising:
a voltage adjusting circuit, for adjusting said reference signal to output a voltage adjusting signal; and
a lowpass filter, coupled to said voltage adjusting circuit, for lowpass filtering said voltage adjusting signal to output said reference voltage.
- [c6] 6. The flashlight control device of claim 4, wherein said reference signal is adjusted by a pulse width modulation.
- [c7] 7. The flashlight control device of claim 2, wherein said light-tuning circuit further comprises a discharger circuit, coupled to said integrator, for receiving a discharger signal from said central processor unit, said integrator discharging through said discharger circuit when said discharger signal is an enabled discharger

signal.8. The flashlight control device of claim 1, wherein said flashlight trigger circuit further comprises an Insulated Gate Bipolar Transistor for enabling or disabling said flashlight trigger circuit to emit an incident light.

[c8] 8. The flashlight control device of claim 1, wherein said flashlight trigger circuit further comprises an Insulated Gate Bipolar Transistor for enabling or disabling said flashlight trigger circuit to emit an incident light.

[c9] 9. A method of operating a flashlight control device, for a digital camera using a flashlight, comprising the steps of:
triggering said flashlight to emit an incident light to an object;
receiving a reflected light reflected from said object, and optics-electricity conversing said reflected light to an exposure voltage; and
stopping emitting said incident light, responsive to said exposure voltage higher than a reference voltage.

[c10] 10. The method of operating a flashlight control device 9, said step of receiving a reflected light and optics-electricity conversing said reflective light to an exposure voltage, further comprising:
conversing said reflected light to an exposure current;
and

integrating said exposure current to output said exposure voltage.

- [c11] 11. The method of operating a flashlight control device 9, wherein said reference voltage is adjustable.
- [c12] 12. The method of operating a flashlight control device 9, further comprising the step of charging a capacitor to generate a charging voltage for supplying said flashlight.
- [c13] 13. The method of operating a flashlight control device 12, further comprising the steps of:
detecting said charging voltage; and
stopping charging said capacitor, responsive to said charging voltage reaching a predetermined voltage.